Creating New Perspectives: An Investigation of Therapist Strategies and the Promotion of Cognitive Change

Undergraduate Research Thesis

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by

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Abstract

Introduction: Little is known about the means by which cognitive therapy (CT), an empirically supported treatment for depression, achieves its effects. In a recent study, within-patient cognitive change (CC) was found to predict session-to-session symptom change in CT (Schmidt, Pfeifer, & Strunk, in press). Drawing from that same study, I selected two consecutive sessions for which patients reported dramatically different amounts of CC from a group of 62 patients undergoing CT for depression. Observers rated these sessions for therapists' use of cognitive methods intended to promote CC, as well as other psychotherapy process variables.

Methods: A sample of 126 patients participating in a study of CT for depression rated their CC at the conclusion of each therapy session. For each patient, I identified successive sessions with the largest difference in the amount of CC reported. The 62 patients with the largest of these differences were selected for further study. These high and low CC sessions were coded by observers (blind to session type) for therapists' use of cognitive methods, as well as Socratic questioning, behavioral methods, and the therapeutic alliance.

Results: Raters' judgments of cognitive methods were moderately reliable (Intraclass Correlation Coefficient (ICC) = .61). Reliability for judgments of the three other process measures ranged from moderate to good (ICCs = .61 to .79). Therapists' use of cognitive methods differentiated the high and low CC sessions. There were no significant effects of severity of symptoms at intake, session number within the course of CT, and whether the high or low CC session occurred first. No other observer rating exhibited this relation.

Conclusion: These findings are consistent with the idea that cognitive methods promote CC in CT. I discuss my finding in light of the mixed literature on the role of CC in CT. I suggest

distinguishing between treatment procedures (e.g., cognitive methods) and potential therapeutic mechanisms (e.g., CC) may be key to resolving the mixed findings in the literature.

Creating New Perspectives: An Investigation of Therapist Strategies and the Promotion of Cognitive Change

Cognitive Therapy (CT; Beck, Rush, Shaw, & Emery, 1979) is a widely used treatment for depression (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012), with a substantial evidence base supporting its efficacy (Hollon & Ponniah, 2010; Strunk & DeRubeis, 2001). CT for depression is based on Beck's (1967) theory that those with depression have, due to a variety of internal and external factors, developed inaccurate or distorted automatic thought patterns and assumptions (Beck et al., 1979; Beck, 2005). CT seeks to guide patients toward more realistic and adaptive thoughts about themselves and the world around them through the development of skills with which to actively acknowledge and correct the maladaptive cognitive biases they have developed. The result of this process of thoughts being reconsidered and corrected by the patient is known as cognitive change (Barber & DeRubeis, 1989). An example of cognitive change leading to symptom change could therefore be thought of as believing one has worth leading to improvements in day-to-day mood. That is, a key goal of CT is to improve patients' mood and decrease their depressive symptoms by facilitating cognitive change.

The model underlying CT posits that that cognitive change contributes to symptom change in CT (Lorenzo-Luaces, German, & DeRubeis, 2015). This potential mechanism could explain in part why when compared to antidepressant medication (ADM), CT displays comparably positive responses, but more sustained responses (DeRubeis, Gelfand, Tang, & Simons, 1999; DeRubeis et al., 2005; Vittengl, Clark, Dunn, & Jarrett, 2007). More specifically on the latter point, patients who have had their depression treated to the point of response with CT, and then discontinued CT as a result, have been found to be 50% less likely to relapse into depression as those who have been treated to remission with ADM and then discontinued ADM (Gloaguen, Cottraux, Cucherat, & Blackburn, 1998), even for those who were more severely

depressed (Hollon et al., 2005). Being treated with CT, even if the mechanism is not yet well understood, leads to positive long-term outcomes. Thus, it can be reasonably concluded that understanding the mechanisms of treatment within CT is important, as having this understanding may help us to refine and more effectively disseminate it.

Role of Cognitive Change in CT

How is cognitive change related to symptom improvement in CT? There is considerable evidence that cognitive change is associated with positive treatment outcomes, in CT and in other treatments (Lorenzo-Luaces et al., 2015). Fewer studies have examined whether earlier cognitive changes predict subsequent symptom changes. Among those that have, some studies have found evidence for such a relationship, but others have not (Jarrett, Vittengl, Doyle, & Clark, 2007; DeRubeis et al., 1990; Jacobson et al., 1996). One line of research examining the relation of cognitive change and symptom change has examined this relation in the context of sudden gains. Sudden gains represent abrupt and sizable reductions in symptoms between individual sessions of CT. In CT for depression, sudden gains have been found to be preceded by sessions in which significant within-session cognitive change has been observed (Tang & DeRubeis, 1999; Tang, DeRubeis, Beberman, & Pham, 2005), and sudden gains represent some 50% of overall improvement (Tang, DeRubeis, Hollon, Amsterdam, & Shelton, 2007). At the same time, not all those whose depression responds to CT experience sudden gains, and the process of change in sudden gains may not be the same as that driving more gradual session-to-session changes over the course of therapy. Altogether, while sudden gains research does provide compelling evidence for cognitive change preceding symptom change, the extent to which this characterizes the process of change outside of sessions surrounding sudden gains remains unclear.

Cognitive Methods

Therapists utilize cognitive methods in order to support cognitive change and help patients develop cognitive skills to evaluate the accuracy of their negative automatic thoughts on their own. These therapist methods include (but are not limited to) having patients record their thoughts, encouraging patients to examine the available evidence for their present belief, and relating their improvements in therapy to cognitive change. Several studies have found evidence that patients' increased use of cognitive skills is concurrently associated with symptom improvement (Barber & DeRubeis, 2001; Strunk, Hollars, Adler, Goldstein, & Braun, 2014). However, the evidence for cognitive methods by the therapist predicting cognitive change and that change, in turn, predicting symptom change is much more limited. For example, in Strunk, Cooper, Ryan, DeRubeis, and Hollon (2012), cognitive methods failed to emerge as a significant predictor of subsequent session-to-session symptom change in a sample between treated with both CT and pharmacotherapy.

Nevertheless, in the same dataset utilized in this study, Schmidt et al. (in press) found that therapist adherence to cognitive methods was the sole process variable for which variation within-patients significantly predicted higher cognitive change (CC) scores at the end of each of the first five sessions of therapy. CC was also found to predict session-to-session depressive symptom improvement. A conceptual model showing the posited mediational relationship among cognitive methods, cognitive change, and symptom change is provided in Figure 1. Informed by this past research, this study sought to expand upon this evaluation of the underpinnings of cognitive change in what I believe to be a new way. Difference scores were taken for every available consecutive session pair in the dataset, the absolute values of these scores were calculated, and the two sessions resulting in the greatest in magnitude session-to-

session difference in cognitive change scores was kept for each patient, creating a respective 'high' and 'low' cognitive change session in each pair. Sessions resulting in the top 50% in magnitude of difference scores were kept for the study. This method has the potential to provide a powerful test of therapist behaviors that promote cognitive change.

Socratic Questioning

Another major therapist strategy in CT involves the use of Socratic questioning (Beck et al., 1979; Beck, Wright, Newman, & Liese, 2011; Beck, 1995; IAPT Programme, 2007). In using Socratic questioning, the therapist avoids using a didactic or lecturing approach; instead guiding the patient through open-ended questions to the establishment of new, broader perspectives of their own (Overholser, 2011). Rather than presenting patients with questions to which there are explicitly right and wrong answers, or directly lecturing the patient on what they should do, Socratic questioning can be viewed as a process in which the therapist is helping the patient to apply cognitive skills and develop new, healthier perspectives (Beck et al., 1979; Beck, 2011; Calero-Elvira, Froján-Parga, Ruiz-Sancho, & Alpañés-Freitag, 2013; Overholser, 1993). Success in generating realistic perspectives then helps the patient to autonomously implement skills presented in treatment into their daily lives, such as asking themselves similar questions to those in CT in order to find alternative responses to the negative automatic thought patterns that serve to perpetuate their depression (Beck, 1995; Beck et al., 1979; Calero-Elvira et al., 2013; Overholser, 1993).

Despite the view of Socratic questioning playing a vital role in CT (Beck et al., 1979; Beck et al., 2011; Beck, 2011; IAPT Programme, 2007), little is known about how it exactly it may function to promote cognitive change or symptom change in CT. Therefore, how to best deliver Socratic questioning to target these goals remains largely unknown. Braun, Strunk, Sasso,

and Cooper (2015) sought to advance our knowledge in this area, finding that Socratic questioning was a significant predictor of symptom change in early CT sessions (sessions 1-3). However, in another study by Braun (2018), neither within-patient scores for Socratic questioning as rated by observers after viewing therapy sessions 1-5 nor ratings of such questioning in transcripts of sessions 2-4 predicted session-to-session symptom change. Therefore, whether Socratic questioning predicts cognitive change or symptom change still requires investigation.

Additional Process Variables

The therapeutic alliance can be defined as the agreement between patient and therapist and overall strength of their relationship. Falkenström, Granström, and Holmqvist (2013) studied the therapeutic alliance and found that it predicted subsequent symptom change. Further, an additional finding by Schmidt et al. (in press) was of a significant relationship between a patient's average alliance score across sessions (i.e., the between patient scores) and higher CC. They failed to find evidence of a relationship between within-patient alliance and CC. Evidence of only a relation of between-patient alliance and CC might be explained by stable individual differences that could have contributed to both the alliance and CC.

Behavioral methods can be defined as strategies by the therapist intended to encourage self-monitoring of activity, especially that of identifying one's activity patterns that may promote positive or negative emotional states. Jacobson et al. (1996) found that behavioral methods alone can yield considerable symptom improvement. Altogether, based on the evidence in the literature regarding behavioral methods and the therapeutic alliance as alternative contributors to therapeutic gains, it was determined that they would also be evaluated as process variables along with cognitive methods and Socratic questioning.

Purpose of the Study

In this study, I will further explore cognitive methods and the three other process variables (i.e., Socratic questioning, behavioral methods, and the therapeutic alliance) as potential predictors of cognitive change in CT. It is expected that instances of greater use of cognitive methods by the therapist in a session will predict that session having higher vs. lower CC. In total, it is hoped that this study will be a significant step toward understanding the role of therapists in harnessing what has long been posited as the mechanism of change in CT, CC.

Methods

CT Study Participants

Participants were drawn from a naturalistic study of CT of depression. In a two-year period, 351 phone screens were conducted. Criteria assessed via phone screen were: (a) meeting criteria for a current MDD diagnosis; (b) no self-reported history of manic episodes or current substance dependence; (c) either not on any ADM and willing to commit to not starting medication during the course of the study, or on ADM with no intentions to alter it; and (d) willing to commit to 16 weeks of treatment. Based on the phone screens, 193 individuals were invited to partake in the initial evaluation. At this point, 43 individuals failed to attend their scheduled evaluation appointment, and one individual opted out of participation before their eligibility was evaluated. Inclusion criteria were as follows: (a) primary diagnosis of major depressive disorder (MDD) as measured by the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders-IV (First, Spitzer, Gibbon, & Williams, 2002); (b) age of 18-years-old or older; and (c) being able and willing to give informed consent. Exclusion criteria were as follows: (d) history of bipolar affective disorder or psychosis; (e) current Axis I disorder other than MDD if it is the predominant aspect of the clinical presentation and if it requires treatment other than what is being offered; (f) history of substance dependence in the

past six months; (g) clear indication of secondary gain, such as court ordered treatment; or (h) current suicide risk or significant intentional self-harm sufficient to preclude outpatient treatment.

Of the 149 individuals who participated in the intake assessment, 23 were determined to not qualify for the study. Exclusion criteria included insufficient depressive symptoms for an MDD diagnosis (n = 8), a history of bipolar disorder or manic episodes (n = 6), presence of psychosis (n = 1), a primary clinical presentation other than depression (n = 4), a history of substance dependence in the last six months (n = 3), and unwillingness to end current therapy (n = 1). Ultimately, 126 individuals seeking psychological treatment succeeded in initial evaluations and were enrolled in a study of CT.

Sample Selection

A sample of patients with the top 50% in magnitude of greatest session-to-session differences (either increases or decreases) in scores for self-rated CC was taken from the total of 126 patients enrolled in the study. This decision yielded a total sample of 62 patients, each with one high and low CC session, for a total of 124 sessions of interest. Utilizing this smaller, more extreme group of pairs was intended to create a more powerful test of what therapist behaviors may promote higher vs. lower cognitive change, and to limit between-patient and time-in-treatment effects as alternative explanation for any differences identified. Of the 62 individuals remaining for analysis, 68% were female, and the average age was 30.8 (*SD* = 13.85, overall age range of 18 to 67). The sample was 79% Caucasian, 10% African American, 6% Asian American, and 5% Hispanic American.

In the sample, CC scores labeled high ranged from 11 to 30, with an average of 22. This average was in the 73rd percentile of all recorded CC scores (i.e. for every session for all 126

enrolled patients). CC scores labeled low ranged from 0 to 19, with an average of 9. This average was in the 11th percentile of all scores. Within patients, the average *z*-score for their CC score labeled high was 0.91, putting this score on average in the 82nd percentile of individual patients' scores. For their sessions labeled low, the average *z*-score was -1.88, putting this score on average in the 3rd percentile of individual patients' scores. The average absolute difference in session-to-session CC scores in the sample was 13, with a range of 9 to 21. 13 is in the 98th percentile of all session-to-session absolute differences in scores. Session numbers within pairs ranged from 1 to 19, with an average first session number of 8, which is in the 45th percentile of all session numbers. Approximately 60% of session pairs (37 of 62) displayed increases in CC (i.e. going from a low to high scored session), while approximately 40% (25 of 62) displayed decreases in CC (i.e. going from a high to low scored session).

Therapists

CT in the study was delivered by five advanced graduate students under the supervision of Daniel R. Strunk, Ph.D. Therapists were randomly assigned to patients, with two restrictions on randomization: (1) odds of assignment to a given therapist were based on the openings in each therapist's caseload, and (2) a patient's intake assessor could not also be assigned as their therapist. All therapists delivered 16 weeks of treatment following procedures described by Beck et al. (1979). Twice-weekly therapy sessions were provided for the first 4 weeks. After this point, patients were given an option of either receiving once or twice-weekly therapy sessions for weeks 5-12. Once-weekly sessions were provided for weeks 13-16.

Patient-Reported Measures

Cognitive change. The Assessment of Immediate Cognitive Change was used to record CC. This is a 5-item self-report measure designed by the lab to assess the degree to which the patient used cognitive strategies over the course of a session, as well as including some items to assess cognitive change. The response items were rated on a 7-point Likert scale, ranging from 0 ('not at all') to 6 ('completely'). The measure was administered to every patient immediately following each session, and the patient was instructed to make ratings based solely on the session that just ended.

Depressive symptoms. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a widely used and validated measure, was used to record depressive symptoms. The BDI-II is a 21-item measure, in which patients self-report their severity on each item on a 4-point scale ranging from 0 to 3. Scores can range from 0 to 63. The measure was administered to every patient prior to beginning each session.

Observer-Rated Measures

Cognitive methods. Cognitive methods were rated using 10 items from the Collaborative Study Psychotherapy Rating Scale-Cognitive Behavioral subscale CSPRS-CB; Hollon et al., 1988) based on Strunk et al. (2012)'s factor analysis. Two of these items, relating thoughts to feelings and reporting cognitions, were removed from analyses due to low inter-rater reliability. Cognitive methods items were rated on a 7-point (0 to 6, 0 being no use of a strategy and 6 being the greatest use) Likert scale. Ratings were completed based on recordings of each session, after the study ended.

Socratic questioning. Socratic questioning was rated using the 5-item Socratic Questioning Scale (SQS) created by Braun et al. (2015). SQS items were rated on a 7-point (0 to

6, 0 being no use and 6 being the greatest use) Likert scale reflecting the amount and content (e.g., asking about key cognitions or using cognitive strategies to promote alternative perspectives) of Socratic questioning used by the therapist in a given session. Ratings were completed based on recordings of each session, after the study ended.

Therapeutic alliance. The therapeutic alliance was rated using the 35-item observer version of the Working Alliance Inventory (WAI-O; Darchuk, Wang, Weibel, Fende, Anderson & Horvath, 2000). Items were rated on a 7-point Likert scale (0 to 6, 3 being no evidence or equally positive/negative evidence about the item). Ratings were completed based on recordings of each session, after the study ended.

Behavioral methods. Adherence to behavioral methods of CT in the sessions was rated using items from the CSPRS-CB (Hollon et al., 1988). Assessment of behavioral methods utilized a 4-item subscale. These items included: self-monitoring, increasing pleasure and mastery, scheduling/structuring activities, and alternative behaviors. Ratings were completed based on recordings of each session, after the study ended.

Rating Procedure

A team of 7 trained undergraduate raters observed recordings of the 124 included sessions from the study, completing ratings of cognitive methods, Socratic questioning, therapeutic alliance, and behavioral methods utilizing the measures listed above. These recordings were mostly video recordings, with audio-only recordings being supplemented in the few cases of a broken or unavailable video recording. Raters were assigned to recordings as randomly as possible, with five requirements: (a) 3 raters must be assigned to every recording; (b) a rater could not view both sessions of the same patient; (c) each rater was to be assigned to a roughly equal number of sessions (5 raters were assigned to 53 sessions, 2 were assigned to 54

sessions, and 1 was assigned to 52 sessions); (d) despite being blind to a session's high/low type, raters were assigned fairly equally to each type (2 raters were assigned to 28 high sessions and 26 low sessions, 2 raters were assigned to 25 high and 28 low sessions, 1 rater was assigned to 28 high and 25 low sessions, 1 rater was assigned to 27 high and 26 low sessions, and 1 rater was assigned to 25 high and 27 low sessions); and (e) sets of two raters were paired with each other on the same recording so that raters were paired with each other an approximately equal number of times (the number of times the same two raters were assigned to rate the same session ranged from 15 to 20).

Inter-Rater Reliability

Random effects intraclass correlation coefficients (ICCs) were calculated to evaluate inter-rater reliability on the process measures. The ICCs were corrected for 3 raters to reflect the number of raters per session. The coefficients for each scale were as follows: .61 for cognitive methods, .62 for Socratic questioning, .79 for the therapeutic alliance, and .61 for behavioral methods.

Results

Table 1 provides means and standard deviations for high and low cognitive change sessions for each of the process measures, as well as the results of paired *t*-tests comparing the means across these sessions. As would be expected, high CC type sessions displayed numerically higher scores on all four of the process measures. However, the differences in scores between high and low CC type sessions were only significant for cognitive methods ($t(61) = -3.82$, $p = .0003$, $d = .48$) and therapeutic alliance ($t(61) = -2.97$, $p = .004$, $d = .38$). Table 2 provides correlations between each of the process measures. Cognitive methods and Socratic questioning

were significantly correlated ($r = .73$, $p < .0001$). No other process measures were significantly related.

All analyses to predict session type (a dichotomous variable) utilized PROC GENMOD in SAS. I evaluated three potential covariates as predictors of session type (i.e., high vs. low cognitive change session). In predicting session type, there were no significant effects of those three covariates: session number, order of session type within the patient's pair (i.e., low to high or high to low), or severity of depressive symptoms at intake. As shown in Table 3, when process variables were each examined in models with these predictors, only cognitive methods and therapeutic alliance were identified as significant predictors of session type (i.e., with higher scores predicting high rather than low cognitive change sessions). As shown in Table 4, when the three covariates were eliminated from each of the four models, leaving each process variable to be evaluated completely independently as a predictor of session type, only cognitive methods emerged as significant.

Finally, I examined the four psychotherapy process measures of interest as potential predictors of session type in a combined model. Because none of the three covariates considered were significant predictors of session type, these covariates were not retained in this model. As shown in Table 5, only cognitive methods significantly predicted session type ($z = 2.26$, $p = .02$), such that greater use of cognitive methods by the therapist predicted high (vs. low) cognitive change session type. No other process variable displayed a significant relationship in predicting session type.

Discussion

This study sought to investigate therapist behaviors and other psychotherapy process variables that might serve to promote CC in CT. Informed by past research evaluating these

concepts, especially Schmidt et al. (in press)'s analysis of the first five sessions within this same dataset, it was hypothesized that the facilitation of cognitive skills through cognitive methods by the therapist was the key process variable involved in reaching this treatment goal. The findings of this study are consistent with that hypothesis.

Sessions were selected for inclusion in this study with several goals in mind. One was to compare sessions from the same patients, so that a comparison of high and low cognitive change sessions would not be confounded by differences in the characteristics of patients who tended to have sessions with higher vs. lower amounts of cognitive change. Another was to select successive sessions in order to limit any differences that might be related to patients' time-in-treatment. If psychotherapy process measures change over the course of therapy, one might be concerned that comparisons of process measures across sessions might differ simply as a function of how far into the treatment the session occurred. By selecting successive sessions, such a concern is reduced. A third goal was to provide a powerful test by selecting sessions that differed markedly on CC. By selecting sessions for the extremity of the cognitive change reported, I hoped to have a comparison more sensitive to detecting any differences in therapist strategies or other psychotherapy processes that might differentiate such sessions.

Nonetheless, the session selection procedure is not without limitations. It is possible that differences between the included and non-included groups exist. Using available data, a number of such possibilities could be investigated. For example, those selected may have been more likely to have complicating factors such as maladaptive personality traits. Or, they may have shown greater emotional lability over the course of treatment. Of course, patients included vs. not included could also differ in ways that the available data could not address. Beyond issues related to session selection, it is also important to recognize that variables important in

determining the amount of cognitive change that occurred in-session may have not been assessed. As a simple example, a patient who experienced more positive life events may have come to sessions primed to be more likely to respond positively to the therapist's efforts and develop new, less negative perspectives in-session. Altogether, efforts to assess the generalizability of these findings to all who participate in CT of depression are needed, and alternative explanations for patients' experience of cognitive change still warrant further study.

In conclusion, the pattern of findings from this study was consistent with the idea that therapists' use of cognitive methods may promote correspondingly small or large amounts of client-reported cognitive change, at least when examining large successive differences in cognitive change. This relationship is especially important when considering that another analysis of this dataset showed that CC was found to predict subsequent depressive symptom reduction (Schmidt et al., in press). Putting these findings together, they are consistent with the view that therapist use of cognitive methods may promote cognitive change, which in turn promotes symptom reduction across the course of CT.

To move forward from here, I suggest that research continue to distinguish between treatment procedures (such as cognitive methods) and the potential therapeutic mechanisms they promote (such as CC), as well as begin to investigate how different therapeutic procedures might lead to changes in different potential therapeutic mechanisms. Ultimately, such efforts could provide a richer understanding of how therapists might select specific intervention strategies to leverage different mechanisms that can best produce therapeutic gains for patients.

References

Barber, J. P., & DeRubeis, R. J. (1989). On second thought: Where the action is in cognitive therapy for depression. *Cognitive Therapy and Research*, *13*, 441-457. doi: 10.1007/BF01173905

Barber, J. B., & DeRubeis, R. J. (2001). Change in compensatory skills in cognitive therapy for depression. *Journal of Psychotherapy Practice and Research, 10,* 8–13.

Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects*. Philadelphia, PA: University of Pennsylvania Press.

Beck, A. T. (2005). The current state of cognitive therapy: a 40-year retrospective. *Archives of General Psychiatry*, *62*, 953-959. doi: 10.1001/archpsyc.62.9.953

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York, NY: Guilford Press.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996*). Manual for the Beck Depression Inventory* (2nd ed.) San Antonio, TX: The Psychological Corporation. doi: 20.2037/t00742-000

Beck, A. T., Wright, F. D., Newman, C. F., & Liese, B. S. (2011). *Cognitive therapy of substance abuse*. New York, NY: Guilford.

Beck, J. S. (1995). *Cognitive Therapy: Basics and Beyond*. New York: Guilford.

Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond* (2nd ed.). New York, NY: Guilford.

Braun, J.D. (2018). *Socratic questioning and session-to-session symptom severity in CT for depression: An examination of moderators and mediators* (Unpublished doctoral dissertation). The Ohio State University, Columbus, OH.

Braun, J. D., Strunk, D. R., Sasso, K. E., & Cooper, A. A. (2015). Therapist use of Socratic questioning predicts session-to-session symptom change in cognitive therapy for depression. *Behaviour Research and Therapy*, *70*, 32-37. doi: 10.1016/j.brat.2015.05.004

Calero-Elvira, A., Froján-Parga, M. X., Ruiz-Sancho, E. M., & Alpañés-Freitag, M. (2013). Descriptive study of the Socratic method: Evidence for verbal shaping. *Behavior Therapy*. Advanced Online Publication. http://dx.doi.org/10.1016 /j.beth.2013.08.001

Darchuk, A. J., Wang, V., Weibel, D. T., Fende, J. M., Anderson, T., & Horvath, A. O. (2000). Manual for the *Working Alliance Inventory – Observer Form (WAI-O)*: Revision IV (*Unpublished manuscript*), Ohio University, Athens, OH.

DeRubeis, R. J., Evans, M. D., Hollon, S. D., Garvey, M. J., Grove, W. M., & Tuason, V. B. (1990). How does cognitive therapy work? Cognitive change and symptom change in cognitive therapy and pharmacotherapy for depression. *Journal of Consulting and Clinical Psychology*, 58, 862-869. doi:10.1037/0022-006X.58.6.862

DeRubeis, R. J., Gelfand, L. A., Tang, T. Z., & Simons, A. D. (1999). Medications versus cognitive behavior therapy for severely depressed outpatients: Mega-analysis of four randomized comparisons. American Journal of Psychiatry, 156, 1007-1013. Retrieved from https://ajp.psychiatryonline.org/doi/pdf/10.1176/ajp.156.7.1007

DeRubeis, R. J., Hollon, S. D., Amsterdam, J. D., Shelton, R. C., Young, P. R., Salomon, R. M., ... & Gallop, R. (2005). Cognitive therapy vs. medications in the treatment of moderate to severe depression. *Archives of General Psychiatry*, 62, 409-416. doi: 10.1001/archpsyc.62.4.409

Falkenström, F., Granström, F., & Holmqvist, R. (2013). Therapeutic alliance predicts

symptomatic improvement session by session. *Journal of Counseling Psychology*, *60*, 317- 328. doi: 10.1037/a0032258

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Non-patient Edition (SCID/I/NP).* New York, NY: Biometrics Research, New York State Psychiatric Institute.

Gloaguen, V., Cottraux, J., Cucherat, M., & Blackburn, I. M. (1998). A meta-analysis of the effects of cognitive therapy in depressed clients. *Journal of Affective Disorders*, 49, 59-72. https://doi.org/10.1016/S0165-0327(97)00199-7

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive therapy and research*, *36*, 427-440. doi: 10.1007/s10608-012-9476-1

Hollon, S. D., DeRubeis, R. J., Shelton, R. C., Amsterdam, J. D., Salomon, R. M., O'Reardon, J. P., ... & Gallop, R. (2005). Prevention of relapse following cognitive therapy vs medications in moderate to severe depression. *Archives of General Psychiatry*, 62, 417-422. doi:10.1001/archpsyc.62.4.417

Hollon, S. D., Evans, M. D., Auerbach, A., DeRubeis, R. J., Elkin, I., Lowery, A., … Piasecki, J. M. (1988). Development of a system for rating therapies for depression: Differentiating cognitive therapy, inter- personal psychotherapy and clinical management pharmacotherapy (*Unpublished manuscript*), Vanderbilt University, Nashville, TN.

Hollon, S. D., & Ponniah, K. (2010). A review of empirically supported psychological therapies for mood disorders in adults. *Depression and Anxiety*, 27, 891-932. https://doi.org/10.1002/da.20741

IAPT Programme (2007). *The Competencies Required to Deliver Effective Cognitive and Behavioural Therapy for People with Depression and with Anxiety Disorders*. London: Department of Health.

Jacobson, N. S., Dobson, K. S., Truax, P. A., Addis, M. E., Koerner, K., Gollan, J. K., et al. (1996). A component analysis of cognitive–behavioral treatment for depression. *Journal of Consulting and Clinical Psychology, 64*, 295–304.

Jarrett, R. B., Vittengl, J. R., Doyle, K., & Clark, L. A. (2007). Changes in cognitive content during and following cognitive therapy for recurrent depression: Substantial and enduring, but not predictive of change in depressive symptoms. *Journal of Consulting and Clinical Psychology*, *75*, 432-446. doi: 10.1037/0022-006X.75.3.432

Lorenzo-Luaces, L., German, R. E., & DeRubeis, R. J. (2015). It's complicated: The relation between cognitive change procedures, cognitive change, and symptom change in cognitive therapy for depression. *Clinical Psychology Review*, *41*, 3-15. doi: 10.1016/j.cpr.2014.12.003 0272-7358

Overholser, J. C. (1993). Elements of the Socratic method: I. Systematic Questioning. *Psychotherapy: Theory, Research, Practice, Training*, 30, 67-74.

Overholser, J. C. (2011). Collaborative empiricism, guided discovery, and the Socratic method: Core processes for effective cognitive therapy. *Clinical Psychology: Science and Practice*, 18, 62-66.

Schmidt, I. D., Pfeifer, B. J. & Strunk, D. R. (in press). Putting the “cognitive” back in cognitive therapy: Sustained cognitive change as a mediator of in-session insights and depressive symptom improvement. *Journal of Consulting and Clinical Psychology*.

Strunk, D. R., Cooper, A. A., Ryan, E. T., DeRubeis, R. J., & Hollon, S. D. (2012). The process of change in cognitive therapy for depression when combined with antidepressant medication: Predictors of early intersession symptom gains. *Journal of Consulting and Clinical Psychology*, *80*(5), 730-738. doi: 10.1037/a0029281

Strunk, D. R., & DeRubeis, R. J. (2001). Cognitive therapy for depression: A review of its efficacy. *Journal of Cognitive Psychotherapy*, 15, 289-297.

Strunk, D. R., Hollars, S. N., Adler, A. D., Goldstein, L. A., & Braun, J. D. (2014). Assessing patients' cognitive therapy skills: Initial evaluation of the competencies of cognitive therapy scale. *Cognitive Therapy and Research*, *38*, 559-569. doi: 10.1007/s10608-014-9617-9

Tang, T. Z., & DeRubeis, R. J. (1999). Sudden gains and critical sessions in cognitive-behavioral therapy for depression. *Journal of Consulting and Clinical Psychology*, *67*, 894-904. doi:10.1037/0022-006X.67.6.894

Tang, T. Z., DeRubeis, R. J., Beberman, R., & Pham, T. (2005). Cognitive changes, critical sessions, and sudden gains in cognitive-behavioral therapy for depression. *Journal of Consulting and Clinical Psychology*, *73*, 168-172. doi: 10.1037/0022-006X.73.1.168

Tang, T. Z., DeRubeis, R. J., Hollon, S. D., Amsterdam, J., & Shelton, R. (2007). Sudden gains in cognitive therapy of depression and depression relapse/recurrence. *Journal of Consulting and Clinical Psychology, 75*, 404-408. doi: 10.1037/0022-006X.75.3.404

Vittengl, J. R., Clark, L. A., Dunn, T. W., & Jarrett, R. B. (2007). Reducing relapse and recurrence in unipolar depression: A comparative meta-analysis of cognitive-behavioral therapy's effects. *Journal of Consulting and Clinical Psychology*, 75, 475–488. http://dx.doi.org/10.1037/0022-006X.75.3.475

Table 1

Descriptive statistics: M, SD, and t-tests of differences between Low and High Cognitive Change Sessions.

	Low CC Session		High CC Session				
	M	*SD*	*M*	*SD*	*t*	*p*	*d*
Process Measures							
Cognitive Methods	0.80	0.48	1.11	0.47	-3.82	0.0003	0.48
Socratic Questioning	1.74	0.83	2.00	0.71	-1.79	0.08	0.23
Therapeutic Alliance	4.30	0.72	4.51	0.61	-2.97	0.004	0.38
Behavioral Methods	0.79	0.56	0.98	0.61	-1.99	0.05	0.27

Note. CC = cognitive change; n = 62 for both low and high CC session types.

Table 2

Correlations among psychotherapy process variables.

	Cognitive Methods	Socratic Questioning	Therapeutic Alliance	Behavioral Methods
Cognitive Methods	--			
Socratic Questioning	.73***	--		
Therapeutic Alliance	.22	-.06	--	
Behavioral Methods	-.02	-.14	.23	--
M	0.96	1.87	4.40	0.88
SD	0.35	0.53	0.61	0.47

Note. Correlations shown are calculated from the average process score for each patient on each of the variables of interest.

n = 62; * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3

Models of Process Measures predicting Low vs. High Cognitive Change Session with Covariates.

Model	*Covariates*	*Predictor*	*Dependent Variable*	*z*	*p*
1	BDI-II at Intake Session Number Session Type Order	Cognitive Methods	Session Type	3.13	0.002
2	BDI-II at Intake Session Number Session Type Order	Socratic Questioning	Session Type	1.67	0.09
3	BDI-II at Intake Session Number Session Type Order	Therapeutic Alliance	Session Type	2.06	0.04
4	BDI-II at Intake Session Number Session Type Order	Behavioral Methods	Session Type	1.83	0.07

Note. Results are for 4 models, all predicting the likelihood of a high (vs. low) type cognitive change session. In each model, all covariates listed above were included as well as the one focal predictor. Values in the table are for the focal predictor only. SAS PROC GENMOD was utilized to calculate results.

Table 4

Models of Individual Process Measures predicting Low vs. High Cognitive Change Session.

Model	*Predictor*	*Dependent Variable*	*z*	*p*
1	Cognitive Methods	Session Type	2.99	0.003
2	Socratic Questioning	Session Type	1.62	0.11
3	Therapeutic Alliance	Session Type	1.97	0.05
4	Behavioral Methods	Session Type	1.87	0.06

Note. Results are for 4 models, all predicting the likelihood of a high type cognitive change session. In each model, only the one focal predictor was included. SAS PROC GENMOD was utilized to calculate results.

Table 5

Model of Process Measures predicting Low vs. High Cognitive Change Session.

	z	*p*
Process Measures		
Cognitive Methods	2.26	0.02
Socratic Questioning	-0.60	0.55
Therapeutic Alliance	-0.07	0.95
Behavioral Methods	1.54	0.12

Note. Results are for one model predicting the likelihood of a high type cognitive change session. All four process variables were included as predictors, with no covariates. SAS PROC GENMOD was utilized to calculate results.

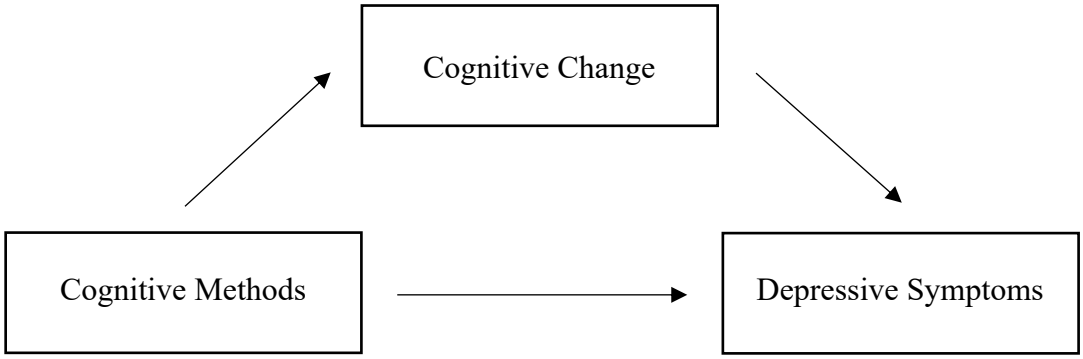

Figure 1. Conceptual model of the role of cognitive methods, cognitive change and session-to-session symptom change in cognitive therapy of depression.